Breeding Alfalfa with More Digestible Stems

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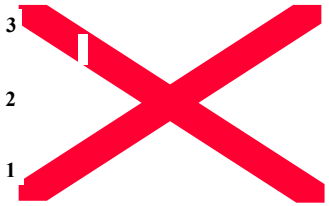
Problem: As alfalfa matures crop yield increases, but quality decreases because leaf-to-stem ratio declines.

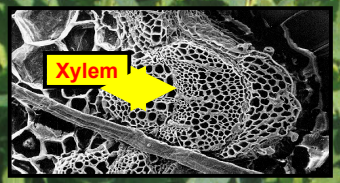


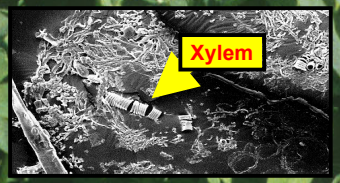
Concentration of fiber (plant cell walls) in alfalfa stems increases with maturity and digestibility of the stem fiber declines.

Alfalfa stems add a tissue called xylem as they mature. Xylem is the same tissue as wood in trees. The xylem contains about 20% lignin which prevents digestion of the carbohydrates in the cell walls of xylem tissue.

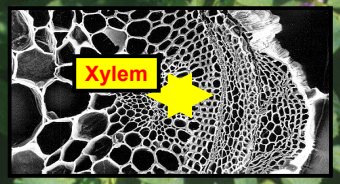
Before Digestion | After Digestion

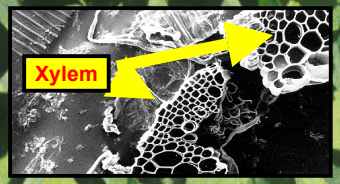
Young Stem



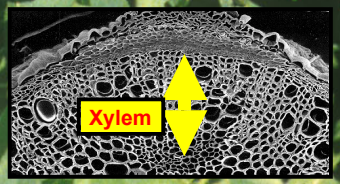


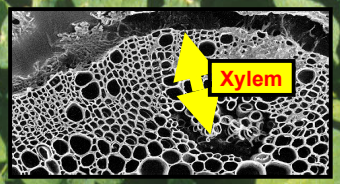
Older Stem





Very Old Stem





Solution: Breed alfalfa plants with less fiber and lignin, and more digestible fiber in their stems.

Cross-pollinating selected high quality alfalfa plants

Alfalfa plants have been selected for low NDF and lignin concentrations, and high NDF digestibility from improved commercial alfalfa varieties. These elite plants have been crossed and their progeny seed have been planted. Quality of the stems from this new generation of alfalfa plants will be evaluated at two harvests for two years. The next generation of high quality alfalfa plants will be selected based on these results.